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ABSTRACT

The paper briefly describes the research foundations of the curriculum at the University of Tulsa (Oklahoma) School for Gifted Children with emphasis on the arts component. The school, serving children from 3 to 11 years of age, bases its curriculum in Enaction Theory originated by S. Ohlsson (1983). The theory stresses the enhancement of thinking through three steps: (1) developing a representational mental model, (2) manipulating that model, and (3) developing rules (heuristics) that lead to a strategy for problem solving. The Rainbow Day Curriculum is an entirely arts based curriculum which is conducted 1 day a week at the school. The program attempts to help students develop an appreciation of a broad spectrum of art work through critical evaluation of art work reproductions representing the three approaches to art of imitationalism, emotionalism, and formalism. Included are a bibliography of 11 items and handouts describing a taxonomy of thinking based on enaction theory, the three approaches to art, and guidelines for art criticism. (DB)

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The Research Foundations of The University of Tulsa School for Gifted Children

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December, 1988

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Abstract

Ohlsson's Enaction Theory and research reported by Glaser are the basis of a total school curriculum for gifted children ages three to eleven. In addition, the one day a week Rainbow Day Arts Curriculum is based on research by Hollingsworth, Gilliatt, and Mittler that demonstrates ways to develop art appreciation in children.

The Research Foundations of
The University of Tulsa School for Gifted Children

Introduction

The framework of the curriculum for the University of Tulsa School for Gifted Children was structured from research. The general curriculum called The Enaction Curriculum, is based on Ohlsson's Enaction Theory (Ohlsson, 1983) and research reported by Glaser (1984). The curriculum for the once-a-week Rainbow Day Arts Program is based on research by Hollingsworth (1983), Gilliatt (1980), and Mittler (1972, 1976).

The Enaction Curriculum

Enaction Theory coupled with domain specific knowledge provides the theoretical base for the Enaction Curriculum. Enaction Theory will be explained, followed by rationale for the theory and rationale for the emphasis on acquisition of specific knowledge.

Ohlsson's Enaction Theory was selected as a curriculum framework because the theory deals with ways of enhancing thinking. The theory postulates that thinking is a matter of running a simulation through one's head. The three steps involved are developing a representational mental model, manipulating that model, and developing rules (heuristic) that lead to a strategy for problem solving. Newell and Simon (1972) have done extensive studies on the faculty

of thought, which led to the formulation of Enaction Theory.

A mental model is not to be equated with a visual image. Though one's model might be an image, a model is a mental representation or replica of an object system. A teacher might introduce a new concept by showing a film, showing a model of the concept or a real object. At the beginning of one unit, insects were brought to class, a film was shown and the five-year-olds drew pictures and sang songs about insects (see Figure 1).

A mental model can undergo change just as the object system in the world undergoes change. This is known as an operator. These mental changes (operators) allow a person to predict an outcome. During the insect unit a terrarium was filled with insects the children captured with bug jars and butterfly nets. It was soon discovered that insects needed food and water. Mental models of insects were now undergoing mental changes. Children began to look for crickets for the praying mantis.

In more complicated problem solving, a thinker must select an operator to apply to the mental model that will get closer to the thinker's goal. A person develops a rule for operator selection. This is called a heuristic. A group of heuristics become a thinking strategy. As the unit progressed the five year old students began to learn rules about insects. One is careful in trying to capture a stinging insect. The tarantula does not

belong in the book on insects. The thinker learns that to achieve a certain goal with this particular mental model one must perform a particular set of heuristics.

The need to develop the capacities for thinking and problem solving in the gifted has been widely publicized (Clark, 1983; Renzulli, 1977; Ward, 1980; Whitmore, 1980). Enaction Theory gives some specific direction for developing thinking skills which seem particularly suited for teaching the gifted. The emphasis of Enaction Theory is on problem solving which is often the forte of the gifted person. This problem solving approach can lead to convergent or divergent thinking. The operations and heuristics can help develop the natural intellectual capacity of the gifted person. Enaction Theory gives a theoretical base for all thinking which Ward (1980) advocates for the gifted individual.

Coupled with the process-oriented Enaction Theory is a strong emphasis on content. Current research (Glaser, 1984) indicates persons with high abilities in thinking and problem solving possess and use a large knowledge base. Glaser has found that "thinking is greatly influenced by experience with new information" (p. 98). From research evidence, Glaser concludes "that problem solving, comprehension and learning are based on knowledge" (p. 100). The emphasis on knowledge acquisition is compatible with the charac-

teristics of young gifted children who not only have a large knowledge base, but enjoy expanding that knowledge.

When we engage creativity and higher level thinking skills, it is done in a content base. The use of techniques to develop thinking and feeling are an integral part of content acquisition.

The Rainbow Day Curriculum

The Rainbow Day Curriculum is as entirely arts based curriculum which is conducted one day a week at our school. There are several studies that directed the focus of this program.

One of the goals of the program is for students to develop an appreciation of a broad spectrum of art work. Research by Gillatt (1980) showed that students' preferences for art work could be expanded by merely exposing them to a variety of art works for a period of time. A number of studies (Hollingsworth, 1983; Gilliatt 1980; Mittler, 1972, 1976) have shown that art criticism has been effective in expanding art preferences. Thus, two important directions of the program are exposing students to a variety of art work and teaching them a number of ways to talk about art (art criticism).

Exposing students to art work is fairly simple. It involves getting good quality, large art reproductions and placing them in the students' environment. In order to expand art preference, it is important that the art reproductions represent at least

three aesthetic approaches to art. The three approaches are imitationalism, emotionalism, and formalism (see Figure 2). Imitationalism means the artist's primary purpose is to imitate the real world as closely as possible. Artists that would fall in this catagory are Winslow Homer and Gilbert Stuart. Emotionalism means that the artist's primary purpose is to express ideas, feelings, or moods. Van Gogh and El Greco would be catagorized as emotionalists. In formalism the artist's primary concern is with the design or the form of the art work. Formalists would be Mondrian and Vasarely. These concepts are introduced to students in a variety of game-type formats. The three aesthetic approaches or theories are used as criterion for judgment when using the art criticism method.

Basically, art criticism is using a method to systematically talk about art. One method involves describing the art work, analyzing how it is designed, interpreting the meaning and making a judgment about the work using a criteria (see Figure 3). Describing the art work means describing all the formal visual elements, the lines, shapes, colors and textures. The next step is to analyze how these visual elements are put together. Is the painting symetrical or asymmetrical? What is the focal point? The third step is to use the information gathered in the description and analysis to help determine the meaning of the work. The first half of the judgment step is to determine the aesthetic purpose

(imitationalism, emotionalism or formalism) that best describes the art work and to decide how well the artist accomplished that purpose. Is this a good example of formalism? The final portion of the judgment step is for personal opinion. Do I like it? A person may decide that the work is an excellent example of emotionalism but still not like the art work.

The approaches of mere exposure and art criticism can be incorporated into any existing program. These methods can help student develop a greater appreciation for art.

The art criticism sheet is used primarily as an introductory tool. As students become familiar with the critical method the criticism sheet is unnecessary.

Both the Enaction Curriculum and the Rainbow Day Curriculum are based on research findings. Because we have found this approach to programming valuable, we will be alert to new research findings.

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Figure 1

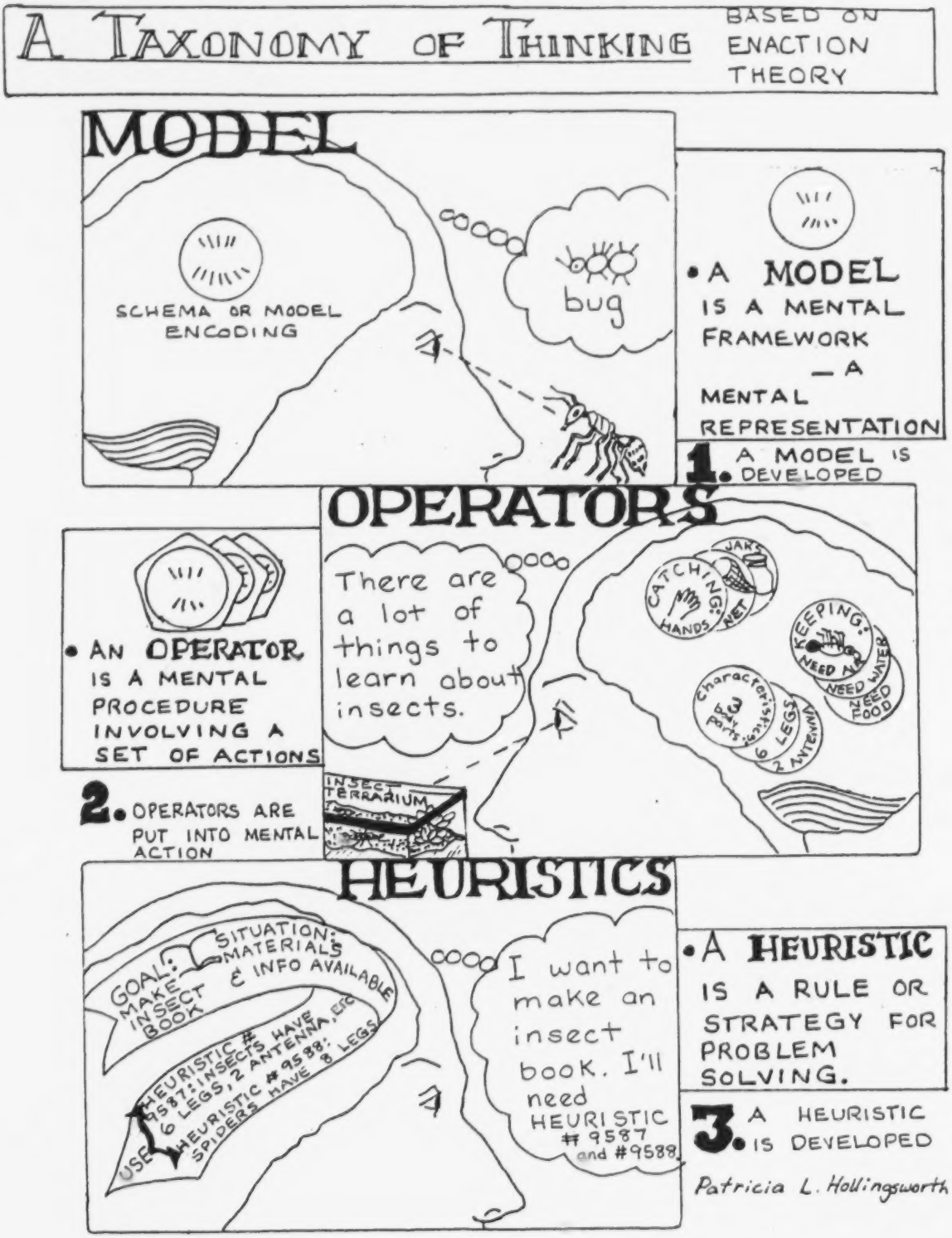
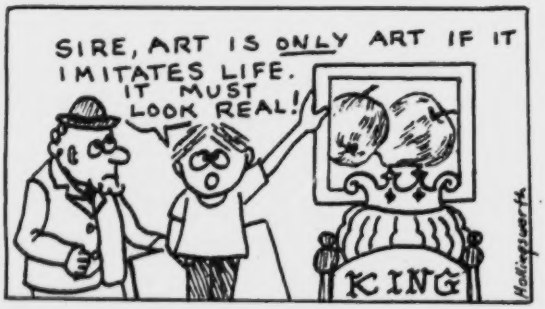

A TAXONOMY OF THINKING
BASED ON ENACTION THEORY
MODEL
SCHEMA OR MODEL ENCODING
bug
• A MODEL IS A MENTAL FRAMEWORK — A MENTAL REPRESENTATION
1. A MODEL IS DEVELOPED
OPERATORS
There are a lot of things to learn about insects.
CATCHING: HANDS, NET, JARS
KEEPING: NEED AIR, NEED WATER, NEED FOOD
Characteristics & parts: 6 LEGS, 2 ANTENNA
INSECT TERRARIUM
• AN OPERATOR IS A MENTAL PROCEDURE INVOLVING A SET OF ACTIONS
2. OPERATORS ARE PUT INTO MENTAL ACTION
HEURISTICS
GOAL: MAKE INSECT BOOK
SITUATION: MATERIALS & INFO AVAILABLE
HEURISTIC #9587: INSECTS HAVE 6 LEGS, 2 ANTENNA, ETC
HEURISTIC #9588: SPIDERS HAVE 8 LEGS
USE
I want to make an insect book. I'll need HEURISTIC #9587 and #9588.
• A HEURISTIC IS A RULE OR STRATEGY FOR PROBLEM SOLVING.
3. A HEURISTIC IS DEVELOPED
Patricia L. Hollingsworth

Figure 2: Art Theories Definitions and Cartoon

ART THEORIES are used to explain what the most important concern of the art work is.

3 Art Theories

1. IMITATIONALISM means trying to make an art work look as real as possible. The artist tries to imitate the real world as we see it. The art work may look like a photograph.



2. EMOTIONALISM means that the artist is trying to express ideas, feelings, or moods. The artist is expressing things we can not see but that are felt, thought about, or imagined.

3. FORMALISM means that the artist is mostly concerned with arranging lines, shapes, colors, and textures. The organization or design of the art work is the most important aspect of formalism. In other words, there is great concern for the form (the design) of the formal elements (lines, colors, shapes, textures).

Things to Do

- Find examples of each of the 3 art theories.
- Draw examples of each of the 3 art theories.
- Draw a cartoon to illustrate the meaning of each of the 3 art theories.

Figure 3: Art Criticism Check Sheet

Name:_____ Grade:__ School:_____Teacher:_____

Name of the painting:_____

Art CRITICISM

A WAY TO TALK ABOUT ART Hollingsworth

STEP 1 THE FACTS

DESCRIBE WHAT YOU SEE IN THE PAINTING

LINES

1. What kinds of lines do you see?

sharp___	fuzzy____
thick___	thin___
jagged__	curved___
heavy___	graceful___
choppy___	smooth___
vertical___	hortizontal__
diagonal___	straight____

_____ _____

SHAPES

2. What kinds of shapes do you see?

circles___	squares___
rectangles___	triangles___
curved___	angular___
soft-edged___	hard-edged___

_____ _____

TEXTURES

3. What kinds of textures do you see?

rough___	soft___
smooth___	hard____
shiny___	dull___

_____ _____

COLORS

4. What kinds of colors do you see?

bright___	dark___
soft_____	strong___

WARM COLORS: COOL COLORS:

reds____	blues___
oranges___	greens___
yellows___	

OPPOSITE COLORS

blues and oranges___
reds and greens____
yellows and purples___

NEUTRAL COLORS:

browns___, grays___, whites____

_____ _____

OBJECTS

5. What kinds of objects do you see?

young people___	trees___
old people___	sky___
buildings___	rocks___
boats___	water___
animals___	food___

musical instrument___
there are no objects___

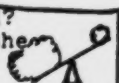
_____ _____

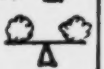
STEP 2 THE DESIGN

LOOK AT THE WAY THE FACTS ARE PUT TOGETHER (DESIGNED)

BALANCE

6. What kind of balance is used?

asymmetrical (each side of the painting is different)___ 

symmetrical (each side of the painting is similar)_____ 

a bit asymmetrical (each side of the painting is a little different)___

LIGHT AREAS

7. Squint your eyes and look at the painting, where do you see the most light areas?

right side___	left side___
bottom___	top___
middle___	_____

FOCAL POINT

8. What is the first thing that you see when you look at the painting?

_____

ILLUSION OF SPACE

9. What kind of space is used?

deep space (painting looks like you can see for miles)____
shallow space (you can not see very far)_____
flat space (things do not seem very 3-dimensional)___

DARK AREAS

10. Squint your eyes and look at the painting, where do you see the most dark areas?

right side___	left side___
bottom___	top___
middle___	_____

Figure 3: Art Criticism Check Sheet (continued)

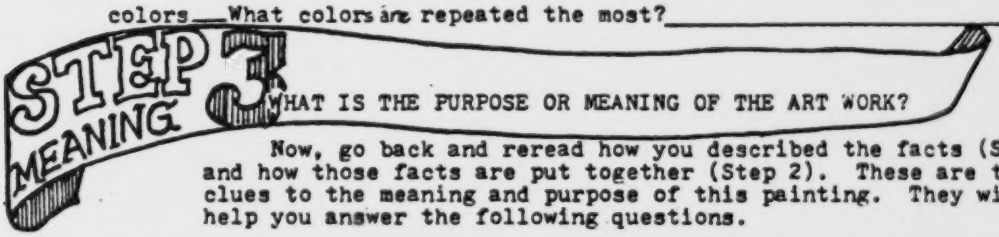
RHYTHM CREATED BY REPETITION

11. What do you see repeated in the painting?

lines___ Draw the kind you see repeated the most_____

shapes___Draw the kind you see repeated the most_____

colors___What colors are repeated the most?_____



Now, go back and reread how you described the facts (Step 1) and how those facts are put together (Step 2). These are the clues to the meaning and purpose of this painting. They will help you answer the following questions.

ASK WHY?

12. The artist seems to be primarily concerned with imitating nature. Yes__,No_

13. The artist seems to be mostly interested in expressing a feeling or an emotion. Yes__, No__

14. The prime concern of this artist seems to be with lines, shapes, colors, and textures and with design or composition. Yes__, No__

15. Does the name of the painting tell you about its meaning or purpose? Yes__, No__

16. Which of the following words best describe what you think is the meaning of this art work (you may use as many words as you need and add some of your own):

strength___	fear___	loneliness___	mystery___
beauty___	hope___	peace___	war___
love ___	hate___	sadness___	happiness___
madness___	anger___	death___	old age___
excitement___	adventure___	enjoyment of work__	fun___
courage___	interest in lines__	interest in shapes__	interest in color_
horror___	simplicity of design__	_____	_____
_____	complexity of design__	_____	_____
_____	_____	_____	_____

17. This painting is an excellent___, good___, bad___ example of
IMITATIONALISM (imitating nature)____.
EMOTIONALISM (showing a feeling or emotion)___.
FORMALISM (making the viewer aware of lines, shapes, colors or design)___.

18. I like___, don't like___ this art work.